Helping Massachusetts Municipalities Create a Cleaner Energy Future

COMMONWEALTH OF MASSACHUSETTS

Charles Baker, Governor
Karyn Polito, Lieutenant Governor
Matthew Beaton, Secretary
Judith Judson, Commissioner

Electric vehicles and Grants for Cities and Towns

Green Communities Division Webinar

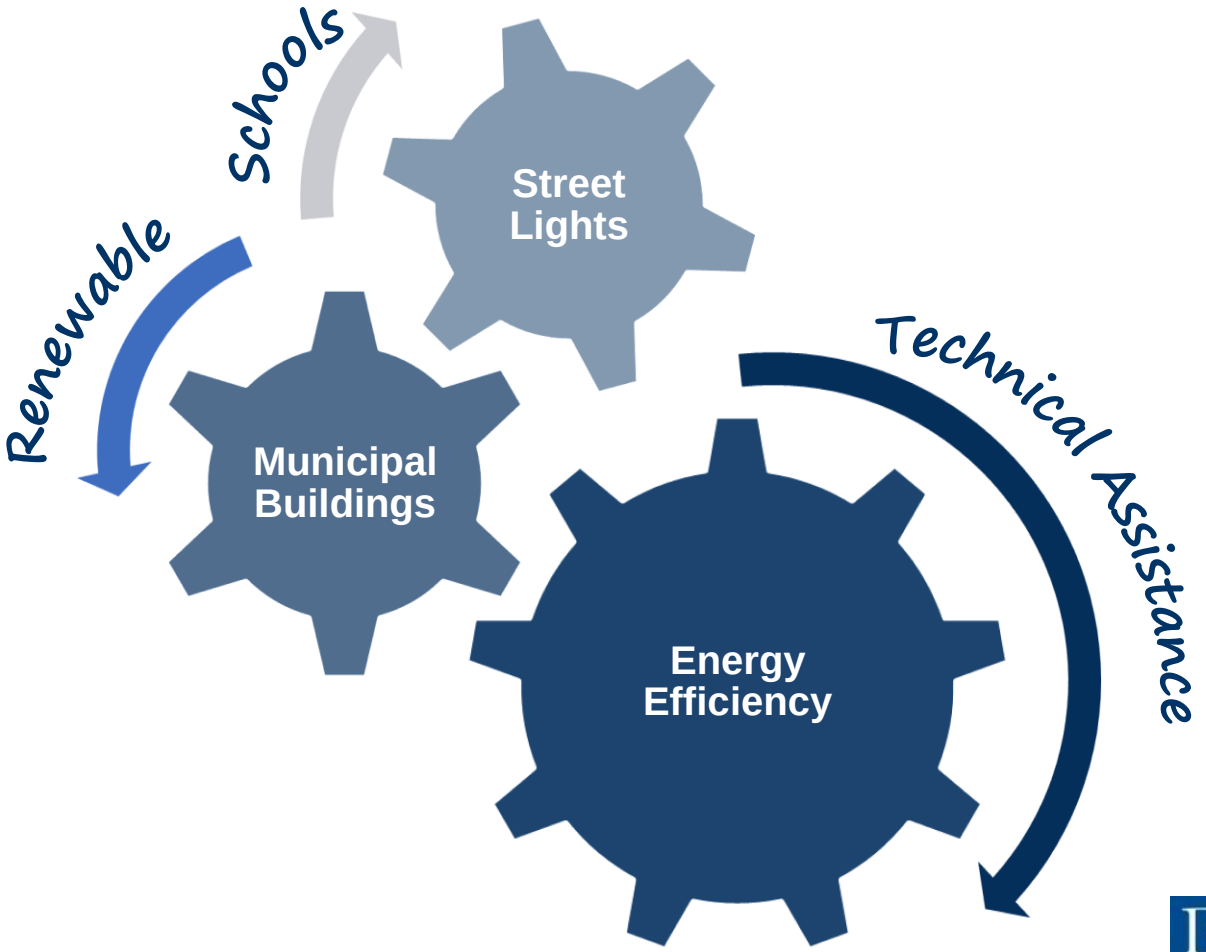
May 31,2016

Webinar presenters

Stephen B. Russell
Alternative Transportation
Department of Energy Resources
Sejal Shah
Environmental Analysis
Department of Environmental Protection

Green Communities Division

The energy hub for ***all*** Massachusetts cities and towns, not just designated “Green Communities.”



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Outreach - Regional Coordinators

- Regional Coordinators act as direct liaisons with cities and towns on energy efficiency and renewable energy activities
- Located at each of the DEP Regional Offices:

WERO – SPRINGFIELD: Jim Barry
Jim.Barry@state.ma.us

NERO – WILMINGTON: Joanne Bissetta
Joanne.Bissetta@state.ma.us

CERO – WORCESTER: Kelly Brown
Kelly.Brown@state.ma.us

SERO – LAKEVILLE: Seth Pickering
Seth.Pickering@state.ma.us

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Green Communities Division -
Programs & Resources for Municipalities

- Green Communities Designation and Grant Program
- MassEnergyInsight energy tracking and analysis tool
- Municipal Energy Efficiency Assistance
- Energy Management Services Technical Assistance
- Mass Municipal Energy Group (MMEG)
- Website filled with tools & resources: www.mass.gov/energy/greencommunities

Email updates via e-blasts – Sign up by sending an email to:

join-ene-greencommunities@listserv.state.ma.us

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Recording & Presentation

- The webinar is being recorded and will be available on our website in approximately 48 hours at: http://www.mass.gov/eea/energy-utilities-clean-tech/webinars.html
- Click on the camera icon top right of your screen to save any slides for future reference
- Use the Q & A icon on your screen to type in questions
- The slide presentation will also be posted at: http://www.mass.gov/eea/energy-utilities-clean-tech/webinars.html

GREEN COMMUNITIES
Criteria 4

- Communities must purchase only fuel-efficient vehicles for municipal use whenever such vehicles are commercially available and practicable.
- The purpose behind this criterion is to reduce carbon dioxide emissions by municipal vehicles, which has a positive impact on the environment and saves the municipality money.

Why BEVs (Battery Electric Vehicles)

1. Better for the environment
   - Reduce carbon emissions, even when energy is sourced from coal
   - Help the nation transition to renewable energy
   - Reduce use of oil, transmission fluid and other hazardous fluids
   - Cut noise pollution
   - Fun to drive
2. Energy independence
   - Keep our energy dollars here
   - Keep and grow jobs here
   - Stabilize transportation costs
3. Future benefits
   - Use of “smart grid” during peak demand
   - Used batteries for a second life as an uninterrupted power supply

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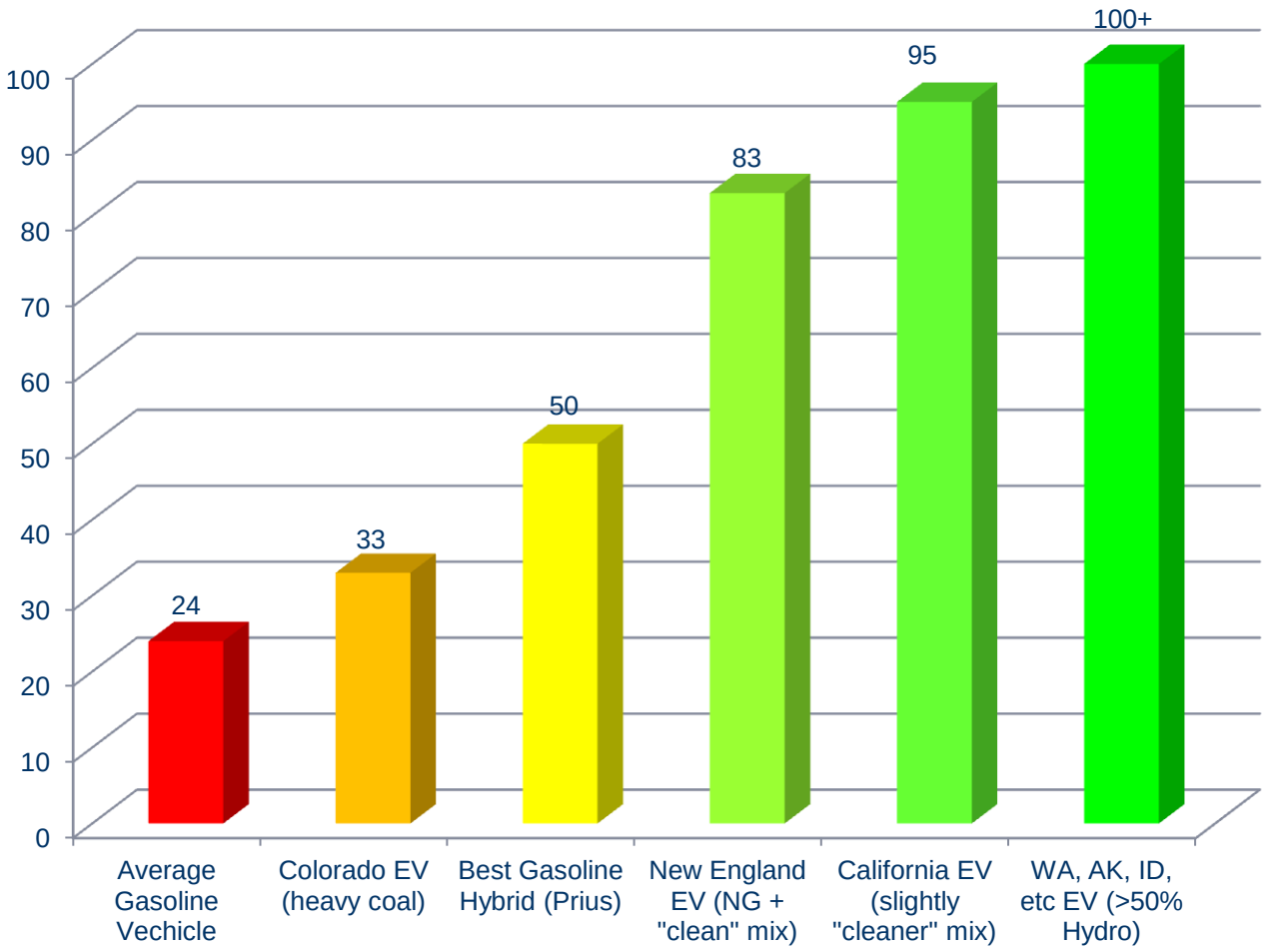
Poll Question

- Have you ever driven an electric vehicle?
  - Yes
  - No
  - Not Sure

Mile Per Gallon of Gasoline versus Equivalent of Electric Vehicles on a Carbon Emission Basis



Summary: Electric cars will reduce greenhouse gases and other emissions, even if the source of electricity is mostly coal, a 2007 study by the Electric Power Research Institute (EPRI) and NRDC showed. There have been some 30 such studies, analyses and presentations on this topic that all reach similar conclusions.

Source: Union of Concerned Scientists, 2014

BEVs and PHEVs available today for Sale

BEV= Battery Electric Vehicle

Nissan Leaf
100 mile range

Ford Focus
60 mile range

Smart
60 mile range

PHEV= Plug in Hybrid Electric Vehicle

Ford C-Max Energi
15 miles range and 100 MPGe

Chevrolet Volt
50 mile range

Poll Question

- Ho many miles do your fleet sedan vehicles drive in a year?
  - 10,000 or less
  - 10,000 – 15,000
  - More than 15,000

These are the MOR-EV consumer rebate eligible vehicles:

BEVs










Plug in Hybrids
















www.morev.org

Massachusetts DEPARTMENT OF ENERGY RESOURCES

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DOER Massachusetts Department of Energy Resources

Charging the vehicle(fueling)

Electric Vehicle Supply Equipment (EVSE):

- The conductors, attachment plugs, and all other equipment specifically installed to transfer energy between premises wiring and the electric vehicle, as well as exchange information.

Charging Level	Setting	Supply Power	Representative Example
AC Level 1	Residential/ Parking Lot 5 mi/hour @ 1.7 kW	120vac/20A (16A continuous)	
AC Level 2 (minimum)	Residential/ Commercial 10 mi/hour @ 3.4 kW	208/240vac/20A (16A continuous)	
AC Level 2 (maximum)	Commercial (up to) 60 mi/hour @ 19.2 kW	208/240vac/100A (80A continuous)	
DC Level 1	Commercial up to 500v @ 80Adc (up to) 120 mi/hour @ 40 kW	208vac/480vac 3-phase (input current proportional to output power; ~20A-200A AC)	
DC Level 2	Commercial up to 500v @ 200Adc (up to) 300 mi/hour @ 100 kW	208vac/480vac 3-phase (input current proportional to output power; ~20A-400A AC)	

Insights into Type and placement of EVSEs

EVSE Type	Positives (+)	Negatives (-)
Level 1	• Cheaper equipment, likely install • Lower electricity demand	• Up to 5 mi/hr @ 1.7kW 8 to 12 hours to charge a battery electric vehicles
Level 2	• 10-60 mi/hr @ 3.4-19.2 kW • Charge multiple vehicles/day • Option of managing load	• More costly than L1 2 to 4 hours to charge a BEV 1 hour for PHEV
DC Fast Charging	• 120-300 mi/hr • Flexible, good for emergencies	• Expensive equipment and installation • Can trip demand charges

Recommendations

- Generally, level 2 is preferred, DCFC may be more suitable in travel corridors
- Know your vehicles, charge power varies
- Promote workplace charging
- Identify public Level 2 charging hot spots
  - Workplaces (#1 venue), retail, and parking lots/garages get used the most

EVSE Unit and Installation cost

EVSE Type	EVSE Unit Cost Range*	Average Installation Cost (per port)	Installation Cost Range (per port)	Source
Level 1	$300 - $1,500	not available	$0- $600	NREL
Level 2	$400 - $7000	~$4,000	$650- $17,000	CO & NY
DCFC	$10,000 - $40,000	~$21,000	$8,500 - $48,000	INL (The EV Project)

Installation cost depends greatly on location.

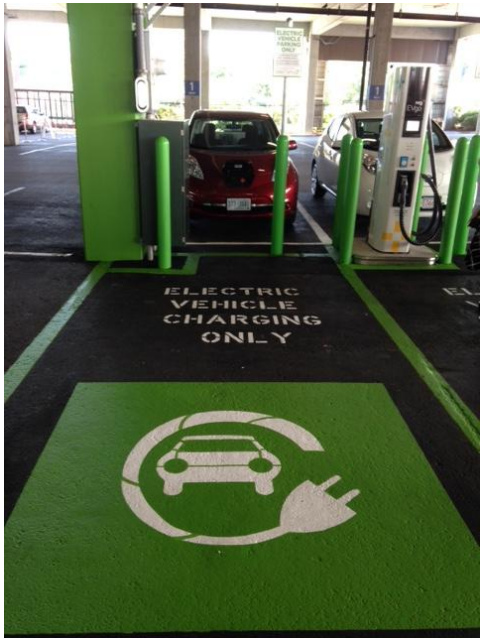
Cost increases as the installation get further from the power source.

Poll Question

- Does your town/city/agency have EVs already in the fleet?
  - Yes
  - No
  - Not Sure

Where are all the EVSEs

Cambridge
Street Boston



Simon Mall
Braintree

Northampton Fire
Department

UMASS
Amherst

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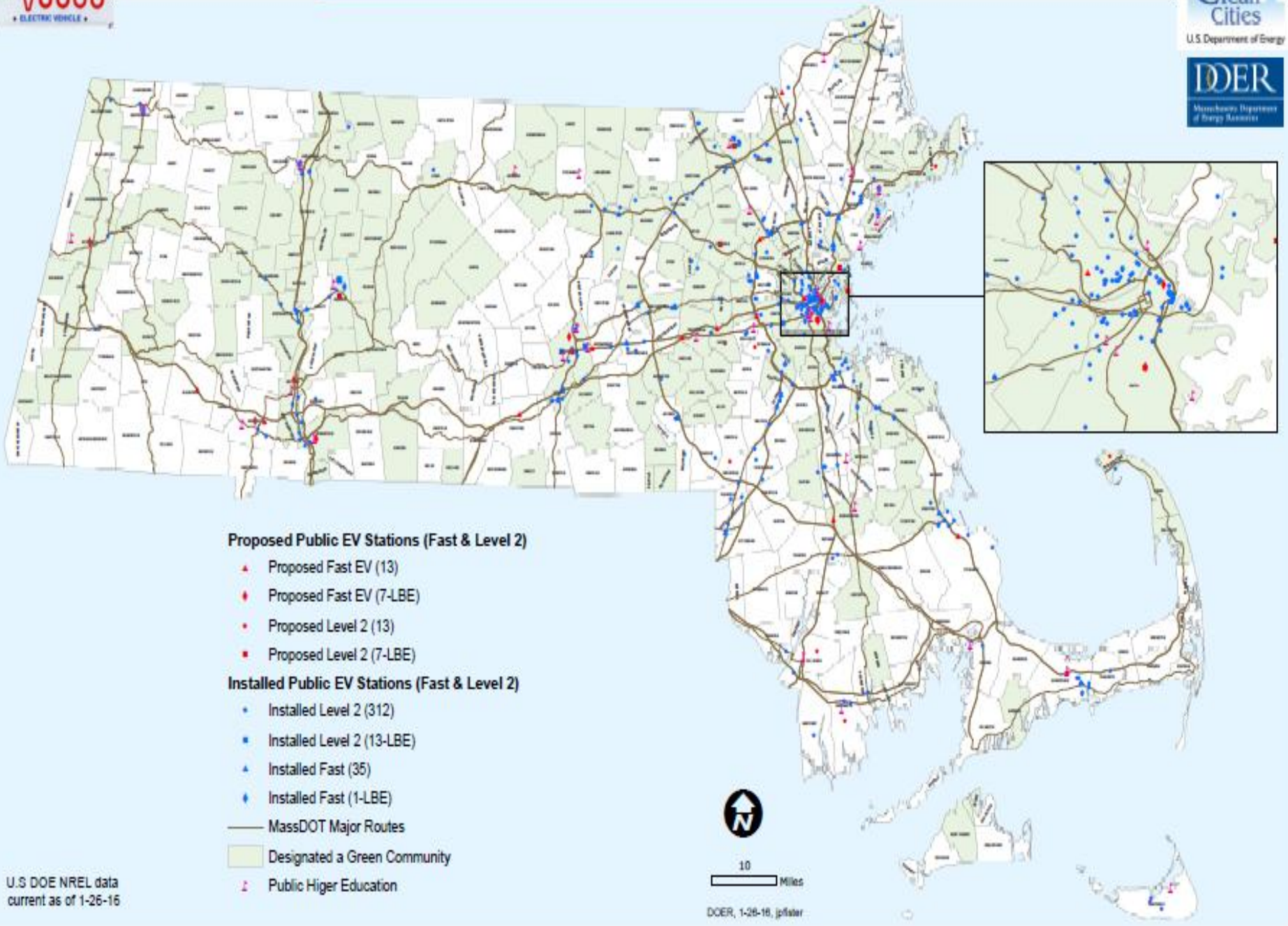
Public EV Charging -- Existing and Proposed

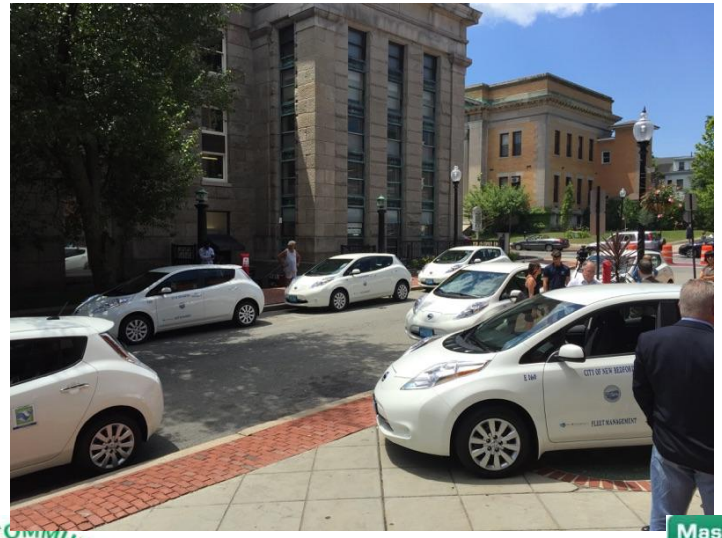


Mass Electric Vehicle Incentive Program (MassEVIP): Fleets

- Official announcement on Earth Day 2013 in Greenfield and Chelmsford
- Provides incentive funding to Massachusetts entities to acquire:
  - Battery-electric vehicles (BEVs) – no ICE (Internal Combustion Engine)
  - Plug-in hybrid vehicles (PHEVs)
  - Level 2 dual head charging stations

MassEVIP: Fleets -- Eligible Entities

- Public Entities
  - Municipalities
  - Public Universities & Colleges
  - State Agencies



MassEVIP: Fleets -- Incentives

Incentive:

- *$7,500 for battery electric vehicles (BEVs)
- *$5,000 for plug-in hybrids (PHEVs)
- **Up to $13,500 to acquire and install a Level 2 Dual Head Charging station

Melrose Charging Station

* Acquisition = Purchase OR Lease

**Entities must purchase at least one battery electric vehicle to receive incentive for charging station

MassEVIP: Fleets -- Program Requirements

- Will commit to using the vehicle in the Commonwealth for at least 36 months
- Entities must purchase at least one battery electric vehicle to receive incentive for charging station
- Charging station must be publicly accessible and space used specifically for electric vehicles

EVs on State Contract VEH98

Chevrolet Volt PHEV

Ford Focus BEV

Ford Fusion PHEV

Ford C-Max Energi PHEV

Hyundai Sonata PHEV

Nissan Leaf - BEV

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EVs NOT on State Contract
VEH98 BUT ELIGIBLE

Toyota Plug in Prius
95 MPGE 12 mile battery

Smart For Two - BEV

Mitsubishi I-MiEV - BEV

VW E-Golf –BEV

Tesla – BEV

BMW i3 – BEV or PHEV

Where are the charging stations?

Level 2 at Braintree Town Hall

Level 2 New Bedford DPW Yard

Level 2 at Chelmsford Town Hall

To find Electric vehicle charging stations in Mass go to: http://www.afdc.energy.gov/

Poll Question

- Would you consider adding EVs to your fleet in the next 6 months?
  - Yes
  - No
  - Not Sure

MassEVIP: Fleets Application Process

- Application period: FIRST COME FIRST SERVED
- Complete and submit to MassDEP an Application Form
- Form and instructions found at:
  - www.mass.gov/eea/agencies/massdep/air/grants/massevip.html
- Applications are reviewed
- MassDEP will issue a Grant Approval within 30 days of receipt of a complete application
- Entity must sign an End-User Agreement
- Upon receipt of the signed End-User Agreement by MassDEP, entity has 180 days to acquire and install charging station

MassEVIP: Fleets Incentive Payment

If Acquired through VEH98

- Incentive paid directly to Dealer
  - Copy of Registration
  - Copy of Invoice

If **NOT** Acquired through VEH98

- Incentive Reimbursed to Applicant
  - Copy of Registration
  - Copy of Invoice

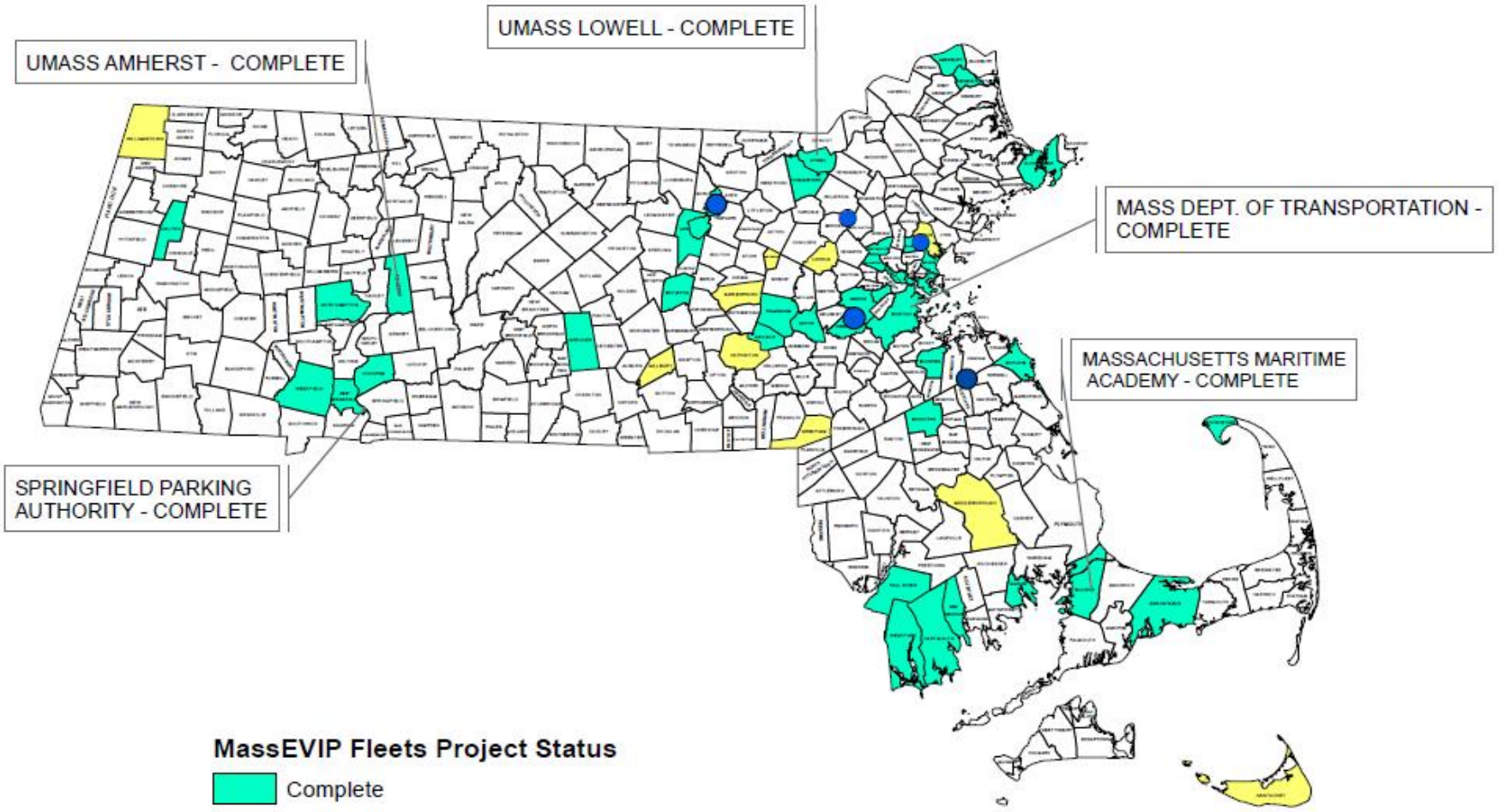
MassEVIP: Fleets -- SO FAR

Through April 30, 2016, awarded ~$1.4 million:

- 45 separate entities
- Vehicles and Charging Stations Awarded
  - 36 Plug-In Hybrid Vehicles (PHEVs)
  - 104 Battery Electric Vehicles (BEVs)
  - 44 Level 2 Dual Head Charging Stations

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection

MASSACHUSETTS ELECTRIC VEHICLE INCENTIVE PROGRAM (MASSEVIP) PROJECT STATUS



April 30, 2016

Contacts

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- For information on the MassEVIP grant program contact: Ms. Sejal Shah –

  E-Mail: sejal.shah@state.ma.us

  Phone – 617-556-1015

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